TTCN-3 Development and Application In Huawei

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Agenda

➤ About Huawei

➤ Milestones of TTCN-3@Huawei

➤ Development of TTCN-3

➤ GTR Development Platform

➤ Extension to TTCN-3@Huawei

➤ Application of TTCN-3@Huawei

➤ Success using TTCN-3

Growing with Huawei
Achieving Together

About Huawei

◆ A leader in providing next generation telecommunications networks

◆ Serving 31 of the world's top 50 operators, along with over one billion users worldwide.

◆ Committing to providing innovative and customized products, services and solutions to create long-term value and growth potential for its customers.

Milestones of Huawei

To enrich life through communication

1988 Incorporated and established its headquarters.

1993 Launched C&C08 digital switch.

1996 Launched HONET integrated access network and optix SDH equipment

1997 Launched GSM equipment.

1998 Obtained patent for the product Digital Micro-Cellular Server Control Switcher.

1999 Selected as the principal supplier for China Mobile's nationwide CAMEL Phase II compliant IN

2002 Launch the world's first mobile wireless LAN.

2003 Launched a nation-wide UMTS service

2005 Won the licence to produce and sell mobile phones to consumers in China.

2006 Huawei showcased its ALL IP-based FMC Solutions at ITU Telecom World 2006.

Why do we need TTCN-3

The motive of developing TTCN-3 solution:

1. Unifying the testing expression in universal and standardized language.

2. Building the flexible testing architecture adaptable to various SUT.

3. Perfect solution for all kinds of testing

4. Open interface to third-party development

5. Supporting systematic testing and test automation

What did TTCN-3 bring us

Once upon a time → *Now with* TTCN 3 Testing & Test Control Notation

- ➢ No well-defined testing language

- ➢ Even if using the same language, various extension of script language cause various test suite architecture

- ➢ Several tools applied in functionality testing

- ➢ Poor reusability of test suites

- ➢ Limited scope for automation testing

- ✓ Unified and standardized testing language

- ✓ Universal test suite architecture

- ✓ General test development platform

- ✓ High reusability of test suites

- ✓ High level automation in various testing

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Milestones of TTCN-3@Huawei

2000 TTCN-2 Runner Development started.

2002 TTCN-2 Runner released and applied with Telelogic Tau in protocol conformance testing, meanwhile the pre-research of TTCN-3 has started.

2004 The first prototype of TTCN-3 tools – TIDE launched.

2005 TTCN-3 Tool and TCL tool integrated together, GTR first version released.

2005~2006   GTR has been widely deployed in software and service, wireless, access network, core network product lines

2007 GTR has reached 1500 users

What's GTR

◆ General Test Runner (GTR) is Script integrated development environment encompassing project management, Script Edit, Script Execution, Result analysis and so on

◆ Supporting both TCL and TTCN-3 language

◆ Open Architecture and interface for the third-party library to be integrated into GTR smoothly

◆ The only test base platform in functionality testing

◆A Huawei proprietary test tool
        - Not available in the market.
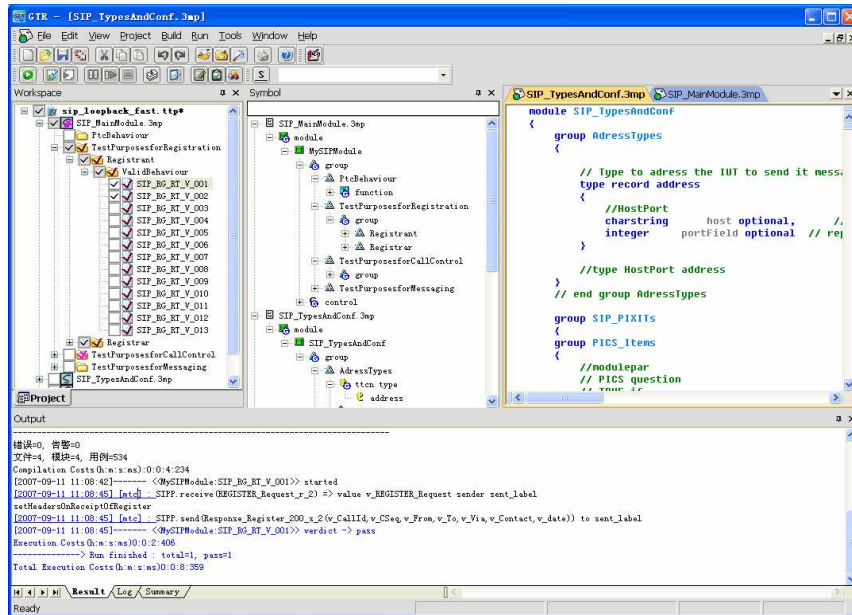
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What can GTR Do?

- ✓ TTCN-3 Core language compiler and executor

- ✓ TTCN-3 Integrated Editor Environment

- ✓ TTCN-3 Codes Debugger

- ✓ TTCN-3 Message tracking, Log recording and analysis

- ✓ Supports ASN.1

- ✓ Supports WSDL, IDL data type mapping to TTCN-3

- ✓ Supports BER,PER,XER, Huawei self-customized TLV and text Codec

- ✓ Supports around 27 SUT adaptors like TCP、UDP、E1 and so on

- ✓ Data Template definition supported through Message Editor
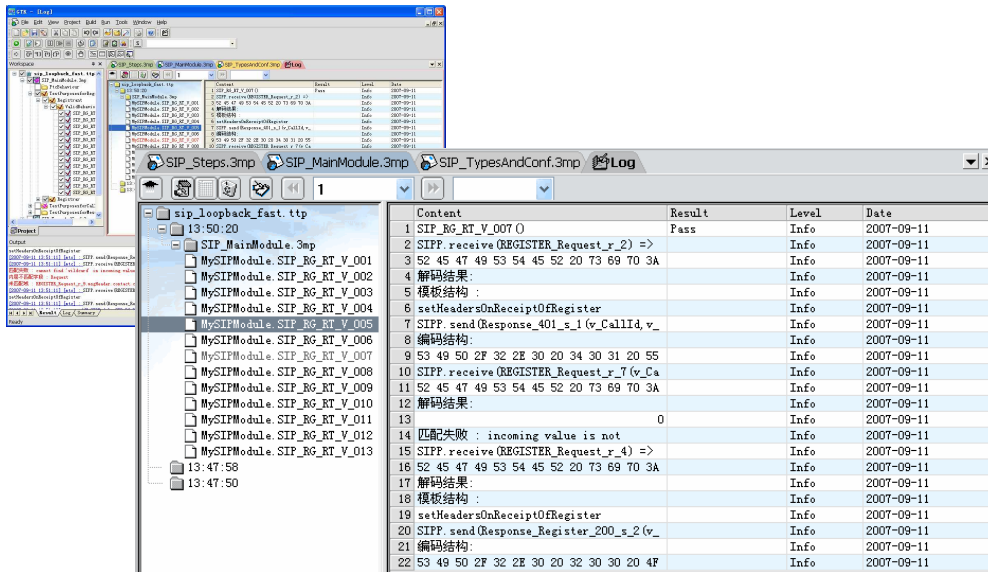
Extensions to TTCN-3@Huawei

- ◆ Embedded TCL Script in TTCN-3 test suite

- ◆ Global variables supported in TTCN-3

- ◆ "**map**" command extended to support more parameters

- ◆ Supported **C++** like **Exception Handling** mechanism

- ◆ Extended encoding and decoding interface in TTCN-3

- ◆ ……

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GTR TTCN-3 IDE

GTR TTCN-3 Log Analysis

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GTR TTCN-3 Test Report generation

report_index - LogViewer

文件(F) 编辑(E) 查看(V) 帮助(H)

		Content	Result	Level	Date	Time
	1	SIP_RG_RT_V_007()	Pass	Info	2007-09-11	13:50:33
	2	SIPP.receive(REGISTER_Request_r_2) => value loc_REGISTER_Request sender sent_label		Info	2007-09-11	13:50:34
	3	52 45 47 49 53 54 45 52 20 73 69 70 3A 31 32 37 2E 30 2E 30 2E 31 3A 36 30 36 30 20 53 49 50 2F 32 2E 30 0A 56 69 61 3A 20 53 49 50 2F 32 2E 30 2F 55 44 50 20 31 32 37 2E 30 2E 30 2E 31 3A 35 30 36 30 3B 62 72 61 6E 63 68 3D 7A 39 68 47 34 62 4B 37 34 66 39 34 38 35 31 36 0A 43 61 6C 6C 2D 49 44 3A 20 31 32 33 34 35 36 37 38 39 30 41 42 43 44 40 68 75 61 77 65 69 2E 63 6F 6D 0A 46 72 6F 6D 3A 20 45 54 53 49 20 49 54 53 54 3C 73 69 70 3A 20 4E 55 54 40 31 32 37 2E 30 2E 30 2E 31 3E 3B 74 61 67 3D 37 36 31 37 35 35 33 39 39 0A 54 6F 3A 20 4F 6E 6C 79 20 4D 65 3C 73 69 70 3A 20 52 65 63 65 69 76 65 72 40 31 32 37 2E 30 2E 30 2E 31 3E 0A 43 53 65 71 3A 20 31 20 52 45 47 49 53 54 45 52 20 0A 43 6F 6E 74 61 63 74 3A 20 45 54 53 49 20 49 54 53 54 3C 73 69 70 3A 20 4E 55 54 40 31 32 37 2E 30 2E 30 2E 31 3A 35 30 36 30 3E 3B 65 78 70 69 72 65 73 3D 33 36 30 30 0A 4D 61 78 2D 46 6F 72 77 61 72 64 73 3A 20 31 36 0A 43 6F 6E 74 65 6E 74 2D 4C 65 6E 67 74 68 3A 20 30 0A 0A		Info	2007-09-11	13:50:34

解码结果: record { requestLine := record { method := REGISTER_E(5), requestUri := record { scheme := "sip", userInfo := omit, hostPort := record { host := "127.0.0.1", portField := 6060 }, urlParameters := omit, headers := omit }, sipVersion := "SIP/2.0" }, msgHeader := set { accept := omit, acceptEncoding := omit, acceptLanguage := omit, alertInfo := omit, allow := omit, authenticationInfo := omit, authorization := omit, callId := record { fieldName := CALL_ID_E(7), callid := "1234567890ABCD@huawei.com" }, callInfo := omit, contact := record { fieldName := CONTACT_E(9), contactBody := { contactAddresses := set of {record

sip_loopback_fast.ttp
  13:50:20
    SIP_MainModule.3mp
      MySIPModule.SIP_RG_

GTR- TTCN-3 Application

Application Area

➢ Protocol Conformance testing

➢ Functional testing

➢ Web service testing

➢ API testing

➢ Simulation of communication system

Application Products

◆ Software and Service

◆ Wireless

◆ Access network

◆ Core network

GTR Achievements

◆ Over 200,000 test cases running based on GTR

◆ Over 100 product testing teams using GTR as basic testing platform

◆ Over 1500 GTR licenses issued till now

Growing with Huawei
Achieving Together

Huawei's success using TTCN-3

■ Good experience in TTCN-2 application for a long time

■ Dedicated team focusing on TTCN-3 base platform development

■ Complying and extending latest standards to meet the special requirements from real product testing teams

■ In-house development ensures the quick response and in-time deliveries for requirements from testing teams

■ Good documentation and user experience publications

■ Yearly internal TTCN-3 user conference

■ Full-time technical support and built TTCN-3 application expert team in different product lines.

Thank You!

**Everlasting Improvement,
Let's work together!**